

I claim:

1. Aluminum-free borosilicate glass with chemical resistance and having a composition, in percent by weight, based on oxide content, of:

SiO_2 60 - 78

B_2O_3 7 - 20

Li_2O 0 - 2

Na_2O 0 - 4

K_2O 3 - 12

MgO 0 - 2

CaO 0 - 2

with $\text{MgO} + \text{CaO}$ 0 - 3

BaO 0 - 3

ZnO 0 - 2

ZrO_2 0.8 - 12

TiO_2 0 - 10

CeO_2 0 - 1

F^- 0 - 0.6

and optionally at least one refining agent in a standard amount for refining.

2. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	67 - 75
B ₂ O ₃	9 - 18
Li ₂ O	0 - 1
Na ₂ O	0 - 3
K ₂ O	5 - 10
with Li ₂ O + Na ₂ O + K ₂ O	5.5 - 13.5
CaO	0 - 1
BaO	0 - 1
ZnO	0 - 1
TiO ₂	0 - 1
ZrO ₂	0.8 - 10.5
CeO ₂	0 - 0.4
F ⁻	0 - 0.6

and optionally at least one refining agent in a standard amount for refining.

3. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	68 - 74
B ₂ O ₃	9 - 13
Li ₂ O	0 - 1

Na₂O 0 - 3
K₂O 5 - 10
with Li₂O + Na₂O + K₂O 5.5 - 13.5
ZrO₂ 3 - 7
CeO₂ 0 - 0.4
F⁻ 0 - 0.6

and optionally at least one refining agent in a standard amount for refining.

4. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO₂ 71 - 74
B₂O₃ 9 - 12
Li₂O 0 - 1
Na₂O 0 - 3
K₂O 7 - 10
with Li₂O + Na₂O + K₂O 7 - 13.5
ZrO₂ 4 - 7,

and optionally at least one refining agent in a standard amount for refining.

5. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO₂ 68 - 71
B₂O₃ 8 - 11

Li_2O 0 - 1
 Na_2O 0 - 3
 K_2O 8 - 11
with $\text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O}$ 8 - 13.5
 ZrO_2 7.5 - 10.5

and optionally at least one refining agent in a standard amount for refining.

6. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO_2 70 - 75
 B_2O_3 15 - 18
 Li_2O 0 - 1
 Na_2O 0 - 3
 K_2O 5 - 8
with $\text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O}$ 5.5 - 10.5
 CaO 0 - 1
 BaO 0 - 1
 TiO_2 0 - 1
 ZrO_2 0.8 - 5

and optionally at least one refining agent in a standard amount for refining.

7. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	67 - 70
B ₂ O ₃	15 - 18
Li ₂ O	0 - 1
Na ₂ O	0 - 3
K ₂ O	7 - 10
with Li ₂ O + Na ₂ O + K ₂ O	7 - 12.5
ZnO	0 - 1
ZrO ₂	2.5 - 6

and optionally at least one refining agent in a standard amount for refining.

8. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	74 - 78
B ₂ O ₃	12 - 15
Li ₂ O	0 - 1
Na ₂ O	0 - 3
K ₂ O	3 - 8
with Li ₂ O + Na ₂ O + K ₂ O	3 - 11
ZnO	0 - 1
ZrO ₂	2.5 - 7

and optionally at least one refining agent in a standard amount for refining.

9. Aluminum-free borosilicate glass as defined in claim 1, and containing at least 0.2 percent by weight of said Li₂O.
10. Aluminum-free borosilicate glass as defined in claim 1, and containing at least 0.3 percent by weight of said Na₂O.
11. Aluminum-free borosilicate glass as defined in claim 1, and containing at least 0.5 percent by weight of said Na₂O.
12. Aluminum-free borosilicate glass as defined in claim 1, and containing at least 0.2 percent by weight of said Li₂O and at least 0.3 percent by weight of said Na₂O.
13. Aluminum-free borosilicate glass as defined in claim 1, free of As₂O₃ and Sb₂O₃ apart from inevitable impurities thereof.
14. Aluminum-free borosilicate glass as defined in claim 1, having a coefficient of thermal expansion α (20°C; 300°C) of between 3.0×10^{-6} /K and 6×10^{-6} / K and a working point V_A of between 990°C and 1290°C.
15. A primary pharmaceutical packaging material consisting of the aluminum-free borosilicate glass as defined in claim 1.

16. A glass fiber comprising the aluminum-free borosilicate glass as defined in claim 1.

17. The glass fiber as defined in claim 16, and having a composition and properties for reinforcing concrete.

18. A sealing glass for tungsten, molybdenum or KOVAR® consisting of the aluminum-free borosilicate glass as defined in claim 1.

19. A fluorescent lamp made with the aluminum-free borosilicate glass as defined in claim 1.

20. The fluorescent lamp as defined in claim 19 and consisting of a miniaturized fluorescent lamps.

21. An apparatus glass consisting of the aluminum-free borosilicate glass as defined in claim 1.